



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

[Handwritten signature]

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,443	07/17/2003	Kouichi Ihata	116626	2096
25944	7590	10/25/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320				SCHEUERMANN, DAVID W
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 10/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,443	IHATA ET AL.	
	Examiner	Art Unit	
	David W. Scheuermann	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 04 October 2005.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 and 25-28 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6,11-24 and 29 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 17 July 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed September 13, 2005 have been fully considered but they are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,4,11-13,15,17,18 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al., US 4841182 in view of Abadia et al., US 5883450, Irie et al., US 5710467, and Aeschlimann et al., US 2003/0178899A1. Tsuchiya et al., US 4841182 show:

An alternator for use in an automotive vehicle, the alternator comprising:

A housing including a front frame 1b and a rear frame 1a;

A cylindrical stator 7 including an armature coil 7a, the cylindrical stator being contained in the housing;

A rotor 3 rotatably disposed inside the cylindrical stator and supported in the housing;

A rectifier 10 mounted on the rear frame;

A rear cover (see figure 1) covering the rectifier, the rear cover being fixed to the housing; and

A cooling fan 3a for introducing cooling air into the housing through air inlets formed on a rear surface of the rear frame after cooling the rectifier, the cooling fan being connected to the rotor, wherein:

The rectifier includes a minus heatsink plate 16 on which minus rectifier elements are mounted and a plus heatsink plate 15 on which plus rectifier elements are mounted, the minus heatsink plate being disposed to face the rear surface of the rear frame forming an air passage therebetween, the plus heatsink plate being disposed to face the rear cover, [the minus heatsink plate and the plus heatsink plate forming a two-story structure in an axial direction];

[A lead terminal led out of each minus rectifier element extends in the axial direction of the rotor toward the rear cover];

The minus heatsink plate includes cooling fins extending in the axial direction and forming radial air passages between the cooling fins; and

[The rear cover includes a plurality of radial openings that are open in a radial direction of the rotor and positioned radially outside of the cooling fins, so that the cooling air is introduced from the radial openings upon rotation of the cooling fan and flows through the radial air passages between the cooling fins and through the air passage between the minus heatsink plate and the rear surface of the rear frame.]

Tsuchiya et al., US 4841182 does not expressly disclose the bracketed structure.

Abadia et al., US 5883450 discloses an axially orientated negative diode lead, for the

Art Unit: 2834

purpose of inherent purpose of extending the lead into the cooled region between the diode body and the cover. Irie et al., US 5710467 discloses a rear cover 4 with a plurality of radial openings 40, see column 4, lines 5-15, for the purpose of inletting cooling air to the rectifier. Aeschlimann et al., US 2003/0178899A1 discloses the minus heatsink plate 22 and the plus heatsink plate 20 forming a two-story structure in an axial direction for the inherent purpose of spreading out the cooling structure in the axial direction to reduce the temperature gradient. Aeschlimann et al., US 2003/0178899A1 also shows positioning the plurality of radial openings radially outside of the cooling fins 4 for the purpose of introducing cooling air immediately to the cooling fins for increase cooling efficiency. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to extend the leads of the negative diode leads in the alternator of Tsuchiya et al., US 4841182 toward the rear cover and place radial holes in the cover. Furthermore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange the minus heatsink plate and the plus heatsink plate so as to form a two-story structure in an axial direction and locate the radial openings outside of the cooling fins of Tsuchiya et al., US 4841182. One of ordinary skill in the art would have been motivated to do this to achieve superior cooling of the rectification diodes.

Re claims 4 and 12 note cooling fins 15a and 5b positioned about the outer periphery of the positive heat sink. .

Re claim 13 and 17 note cooling fins positioned about the outer periphery of the negative heat sink as shown in figure 8(b).

As to claim 15, note that the holes in the cover of the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 are both axial and radial.

Re claim 18, note figure 8(b) and figure 9 showing negative side 16, positive side 16 and mounting bolt 3 which has a mounting hole aligned therewith as depicted in figure 12.

Claims 2, 3 and 14 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 in view of Adachi et al., US 5682070. The combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. The combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 does not expressly disclose, "...wherein the radial passages formed between the cooling fins are arranged along radial lines converging to a center of the rotor" and "...wherein a height of the cooling fin in the axial direction is made equal to or larger than a width of the radial opening in the axial direction, so that foreign particles are prevented from entering into the housing from the radial opening". Adachi et al., US 5682070 discloses radially aligned and shaped fins 282(b), see column 15, lines 35-51, for the purpose of cooling the rectification diodes. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use radial cooling fins and extend to height of the cooling fin in the axial direction to substantially cover the radial opening in the axial direction in the device of the

combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467. One of ordinary skill in the art would have been motivated to do this to achieve superior cooling. Furthermore, the limitations recited in claims 2, 3 and 14 16 do not patentably define over the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Claims 5, 6 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 in view of DuBois et al., US 5757096. The combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. The combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 does not expressly disclose, "...the air passage between the minus heatsink plate and the rear surface of the rear frame includes a plurality of ditches formed on the rear surface of the rear frame; the plurality of ditches are formed along radial lines converging to a center of the rotor and communicated with the air inlets formed on the rear surface of the rear frame; and an end of the minus rectifier elements is exposed to the ditches so that the rectifier elements are cooled by the cooling air flowing through the ditches." DuBois et al., US 5757096 discloses heat fins 52 of rear housing 50, for the purpose of increasing the surface area of the rear housing to improve cooling. At the time the invention was made, it would have been

obvious to a person of ordinary skill in the art to add ditches or heat fins to the rear housing of the motor of the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467. One of ordinary skill in the art would have been motivated to do this to achieve superior cooling. Moreover the ditches merely increase surface area (change in shape), a well-known mechanism for increasing heat transfer efficiency. Furthermore, the limitations recited in these claims do not patentably define over the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 in view of Cheetham et al., US 3538362. The combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 discloses the invention substantially as claimed as set forth in the rejection of claim 11, supra. The combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 do not expressly disclose, "...wherein at least either the cooling fins or the second cooling fins are formed with an angle slanted toward a rotational direction of the rotor, viewed from an outer periphery of the minus heatsink plate", "...wherein at least either the cooling fins or the second cooling fins are formed in parallel to one another thereby forming parallel air passages therebetween," or "...wherein at least either the cooling fins or the second cooling fins are formed in a zigzag shape with respect to the

radial direction". Cheetham et al., US 3538362 disclose fins having portions parallel, portions zigzag shaped and at an angle slanted toward a rotational direction of the rotor, for the purpose of efficiently cooling the rectifier heatsink. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the cooling fin pattern of Cheetham et al., US 3538362 on the alternator of the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467. One of ordinary skill in the art would have been motivated to do this more effectively cool the rectifier diodes. Moreover, one of ordinary skill in the art would have arrived at the recited fin patterns through routine experimentation to improve cooling. Furthermore, the limitations recited in claims 19-21 do not patentably define over the combination of Tsuchiya et al., US 4841182, Abadia et al., US 5883450 and Irie et al., US 5710467 because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

Art Unit: 2834

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David W. Scheuermann whose telephone number is (571) 272-2035. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached at (571) 272-2044. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



dws

October 17, 2005



DARREN SCHUBERG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800